

FIGURE 1

UNIT PRICE CATALOG

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Ave Su
Base Un

System	Description	Cost
col_sprd_ftg	3000 PSI concrete	
1	forms, rebar, conor, placing, finish	\$204.00
sprd_ftg	3000 PSI concrete	
1	Not Req'd (Trench Footing)	\$0.00
2	12" thick x 18" wide; forms, reinf, direct chute	\$12.06
3	12" thick x 24" wide; forms, reinf, direct chute	\$13.71
4	(For Precast Foundations) 12" thick x 24" wide; 3/4" stone bedding	\$2.22
fdn_drain		
1	PVC 4" dia; gravel drain bed	\$4.00
2	PVC 6" dia; gravel drain bed	\$5.00
fdn_wall	4' high foundation wall	
1	Poured-8"; bitum/damp; sill plates	(deduct of 4
2	Poured-10"; bitum/damp; sill plates	\$20.44
3	Poured-10"; brickledge; bitum/damp; sill plates	\$23.60
4	Poured-12"; bitum/damp; sill plates	\$31.16
5	Poured-12"; brickledge; bitum/damp; sill plates	\$26.08
6	Block-8", grouted; bitum/damp; parging; sill plates	\$33.64
7	Block-10", grouted; bitum/damp; parging; sill plates	\$37.84
8	Block-12", grouted; brickledge; parging; bitum/damp; sill plates	\$42.44
9	Pre-Cast Wall System, bitum/damp; sill plates	\$47.28
		\$22.80

FIGURE 2a

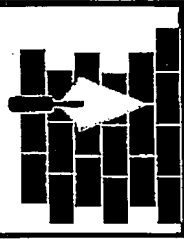
REPLACEMENT SHEET

Location Factor: 0.94			MASTER [BASELINE] RCM			
Sales Tax: 6.0%			Berrien City, MI			
Ave Sub Gen'l Conditions: 2%			Cost Adjustments			
Base Unit	Adjusted Unit		Loc_Fctr	S_Tax	Sub_GC	
Cost	Cost	Unit				
\$204.00	\$201.35	CY	0.94	3%	2%	
\$0.00	\$0.00	LF				
\$12.06	\$11.90	LF	0.94	3%	2%	
\$13.71	\$13.53	LF	0.94	3%	2%	
\$2.22	\$2.19	LF	0.94	3%	2%	
\$4.00	\$3.95	LF	0.94	3%	2%	
\$5.00	\$4.94	LF	0.94	3%	2%	
educt of 4*\$0.70 eliminates 1" rigid insul)						
\$20.44	\$20.17	LF	0.94	3%	2%	
\$23.60	\$23.29	LF	0.94	3%	2%	
\$31.16	\$30.75	LF	0.94	3%	2%	
\$26.08	\$25.74	LF	0.94	3%	2%	
\$33.64	\$33.20	LF	0.94	3%	2%	
\$37.84	\$37.35	LF	0.94	3%	2%	
\$42.44	\$41.89	LF	0.94	3%	2%	
\$47.28	\$46.67	LF	0.94	3%	2%	
\$22.80	\$22.50	LF	0.94	3%	2%	

FIGURE 2b

REPLACEMENT SHEET

SECTION 7: BUILDING SYSTEMS



This final section will explore and document your quality expectations for various building systems in your new home. These decisions are important as they will directly affect the construction budget. In addition, building envelope selections (walls, roof, windows, insulation) will also impact energy heat loss calculations.

01 Foundation

011 Standard Foundations

- ☐ Sand/Gravel Soil
 ☐ Sand/Clay Soil
 ☐ Problem Soils (e.g., water, low soil bearing capacity)

02 Substructure

021 Slab on Grade

- ☐ 4" thick (standard)
 ☐ 5" thick
 ☐ 6" thick

022 Excavation: Basement

- ☐ No Basement
 ☐ Crawlspace
 ☐ Partial Bsmt (some of Ground Floor living area on slab)

023 Basement Walls

- ☐ Wall Material
 ☐ Poured concrete
 ☐ Concrete block/parging
 ☐ Wood foundation

Waterproofing

- ☐ "Superior" Precast Foundation Wall System w/1" insulation
 ☐ Premium Protection

Insulation

- ☐ None
 ☐ 1" Rigid (R-5)
 ☐ 2" Rigid (R-10)
 ☐ 3" Rigid (R-15)* (recommended)

*Energy Star

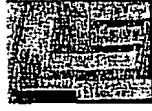
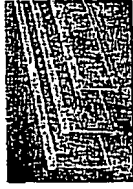
FIGURE 3a

03 Superstructure

031 Floor Construction

NOTE: Priced from least to most expensive per SF of floor system (left to right)

- ☐ 1 Composition "1" Joists
(Standard spans to 24')
* 1" x 3" Ceiling furring not required
- ☐ 2 Dimensional lumber (e.g. 2x12)
(Standard spans to 19')
* Material readily available
- ☐ 3 Truss Joists
(Standard spans to 24')
* Utilities easily pass through



032 Roof Construction

- House ☐ SIP / Timber Frame
- Garage ☐ SIP / Glu Lam Ridge Beam
- Dormers ☐ SIP
- SIP Thickness ☐ SIP Not Used
- ☐ 4.5" OSB/OSB (R-18)
- SIP Interior Finish ☐ 1/2" Gypsum Board
- Prefab trusses ☐ Dimensional lumber (e.g. 2x10)
- ☐ Prefab trusses ☐ Dimensional lumber (e.g. 2x10)
- ☐ Dimensional lumber (e.g. 2x8)
- ☐ 8.25" OSB/OSB (R-34)
- ☐ 6.5" OSB/OSB (R-27)
- ☐ 10.25" OSB/OSB (R-42)
- ☐ 12.25" OSB/OSB (R-45)
- ☐ Tongue & Groove "T&G" (pine or cedar)

033 Stair Construction

- Basement Stair ☐ Basement stairs, open riser
- ☐ Pine treads/risers, box stairs, WALLS 2 SIDES/handrail only
- ☐ Pine treads/risers, box stairs, balusters/handrail, newel post
- Ground Floor Stair ☐ Pine treads / risers (pine), box stairs, balusters/handrail, newel post
- ☐ Hardwood treads / risers, box stairs, WALLS 2 SIDES, balusters/handrail, newel post
- ☐ Hardwood treads / risers, box stairs, balusters/handrail, newel post
- ☐ Curved stairway (hardwood), open 1 side ☐ Curved stairway (hardwood), open 2 sides
- Auxiliary Stair ☐ None
- ☐ Attic stair; folding; pine; 8'-6"
- ☐ Pine treads / risers (pine), box stairs, handrail, newel post
- ☐ Spiral stairs, oak
- ☐ Hardwood treads / risers, box stairs, handrail, newel post
- ☐ Spiral stairs, metal

FIGURE 3b

REPLACEMENT SHEET

ZIP CODE	CITY	STATE	Regional Adjustment Factor	Winter Design Temp	
				99%	97.5%
35000	Cullman	AL	0.85	17	21
35200	Birmingham	AL	0.86	17	21

FIGURE 4a

Deg Days	Deg Days	Sales Tax	Sub GC	Escalation
Heating DD	Cooling DD	Tax Rate		
2,823	1,881	4%	2%	1-50%
2,823	1,881	4%		

FIGURE 4b

REPLACEMENT SHEET

ENERGY MODEL		MASTER [E]	
© 2002 Project Planning & Management, Inc.		TOTAL FINISHED AREA (TFA): 4,778 SF	
		TOTAL CONSTRUCTED AREA: 6,358 SF	
		Bertien City	
		4 Bedroom	

Enter:	State	Residential Energy Code	State	Comments
MI	Michigan	Michigan Uniform Energy Code Part 10 Rules, less stringent than 1992 MEC	Mandate Yes	Prior to June 22, 1977, the state adopted ANSI/ASHRAE 90-1975, which was repealed by the 1995 adoption of the 1995 ASHRAE 90-1995 by April 1, 1997, provide code information. The Michigan

Envelope Heat Loss	Area (SF)	R-Value	U Factor	Delta T	Heat Loss (Btu/hr)
Heat Loss-Basement Walls	1,821	6	0.16	22	6,359
Heat Loss-Basement Floor (or Ground Fir Slab)	3,198	25	0.04	22	2,814
Heat Loss-Walkout Wall	1,500	14	0.07	69	7,555
Heat Loss-Walls	448	14	0.07	69	2,206
Heat Loss-Windows (low-E) Default (R-3)	585	3	0.33	69	13,455
Heat Loss-Windows Standard Glazing (R-2)	0	2	0.50	69	-
Heat Loss-Windows (low-E) Triple Glaze (R-6)	0	6	0.17	69	-
Heat Loss-Doorwalls	126	3	0.33	69	2,898
Heat Loss-Doorwalls	0	3	0.33	69	-
Heat Loss-Doors	84	5	0.20	69	1,159
Heat Loss-Roof SIP (on Timber)	1,283	36	0.03	69	2,439
Heat Loss-Roof SIP (on SIP)	0	0	0.00	69	-
Heat Loss-Attic (Uninsulated Roof Rafters)	547	16	0.06	69	2,383
Heat Loss-Skylights	0	3	0.33	69	-
Building Envelope Heat Loss					41,268

Envelope Tightness	4	Energy Star Very Tight	0.25 ACH (Air Changes / Hour)	Design Occupancy:	5
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FIGURE 5a

REPLACEMENT SHEET

MASTER [BASELINE] RCM

FA: 4,778 SF
 EA: 8,368 SF
 Berrien City, MI
 4 Bedroom; 5 Bath

Comments:

Prior to June 22, 1977, the state of Michigan had no building energy efficiency requirements. On July 27, 1985, the state adopted ANSI/ASHRAE/IES Standard 90A-1980 statewide. SB 719, signed in early January 1996, repealed the 1995 adoption of the 1993 MEC. The legislation directed the state construction code commission to, by April 1, 1997, provide cost-effective standards and establish a program to provide home buyers with energy rating information. The Michigan Uniform Energy Code Part 10 Rules were adopted March 31, 1999.

Delta T Heat Loss (BTUH)

22	6,359
22	2,814
69	7,555
69	2,206
69	13,455
69	-
69	-
69	2,898
69	-
69	1,159
69	2,439
69	-
69	2,383
69	-
Typ Heat Loss	41,268 BTUH
n Occupancy:	5

3	97.5%-99% Design Dry Bulb Temp (deg F)
72	Indoor Design Temp (deg F)
69	Delta T

72,113	Total BTUH Demand
1.4	Furnace Sizing Factor
127,000	Furnace Size at 80%

Meets Energy Star:

113,000	Furnace Size at 90%
108,000	Furnace Size at 94%
101,000	Furnace Size at 100% (ELECTRIC)

FIGURE 5b

REPLACEMENT SHEET

Infiltration / Ventilation	CFM	ACH	Constant	Volume	Delta T	Heat Loss (BTU)
Natural Infiltration	303	0.25	1.08	72,764	69	22,593
Mechanical Ventilation w/AAUX	424	0.35	1.08	72,764	18	8,251
75% AAUX Efficiency	141.09	Min Target CFM				
Envelope + Infiltration Heat Loss = 72,113 BTUH						
Furnace AFUE =		90%	2	<Select Furnace Eff.		
Furnace Size = 80,126 BTUH						
D = Degree Days =		6,439	Berrien City, MI			
T = Temp diff =		69	degrees			
V = Fuel value =		1,052	BTUh per cu ft natural gas			
V = Fuel value =		91,743	BTUh per Gallon propane			
V = Fuel value =		3,413	BTUh per KWH electric			
CF1 =		1.36	Correction factor that includes the effects of rated full load efficiency and energy conservation devices.			
CF2 =		0.71	Empirical correction factor for heating effect versus 65 degrees F			
E = Annual Energy Consumption =						
		164,715	cu ft natural gas			
		1,889	gallons of propane			
		-	KWH of electricity (100% Efficiency)			

Annual Heating Cost =	\$955.35	NGAS
Annual Heating Cost =	\$1,794.32	PROPANE
Annual Heating Cost =	\$0.00	ELECTRIC

FIGURE 5c

HOME SPECIFIC QUALITY / COST SELECTIONS			Selection Switches		TOTAL FINISHED AREA: 4,770 SF		TOTAL UNSTRUCTURED AREA: 6,358 SF		Pr21		BASELINE		Savings
SYSTEM	SUBSYSTEM	DESCRIPTION	quan	unit	unit \$	total \$	quan	unit	unit \$	total \$	BASELINE	TOTAL	
011 Foundation	011 Standard Foundations												
	011.10	Spread footings (under columns)	9	NCOLS	\$46.61	\$419					\$419	\$0	\$0
	011.10	Spread footings (ally columns)	5	EA	\$46.61	\$233					\$233	\$0	\$0
	011.20	Spread footings (foundation walls)	43	LF	\$13.53	\$582					\$582	\$0	\$0
	011.20	Spread footings (basement walls)	352	LF	\$18.47	\$6,506					\$6,506	\$0	\$0
	011.30	Foundation Wall (4' high)	230	LF	\$20.17	\$4,640					\$4,640	\$0	\$0
	011.40	Excavation: Foundation Wall Footing	345	SF	\$0.33	\$136					\$136	\$0	\$0
	012 Special Foundations	1 No additional special foundations	345	SF	\$0.00	\$0					\$0	\$0	\$0
	021 Slab on Grade	3 Not Used	0	SF	\$0.00	\$0					\$0	\$0	\$0
021 Slab on Grade	021 Slab on Grade												
	021.00	Ground Floor Slab on Grade	864	SF	\$2.69	\$2,328					\$2,328	\$0	\$0
	021.00	Garage Floor Slab on Grade	3,198	SF	\$2.69	\$8,617					\$8,617	\$0	\$0
	021.00	Basement Slab on Grade	0	SF	\$0.00	\$0					\$0	\$0	\$0
	021.10	Basement Slab Insulation	1,055	CY	\$5.75	\$6,125					\$6,125	\$0	\$0
	022 excavation: Basement	1 Assumes off-site hauling NOT required (Assumes on site placement of spoils)	0	CY	\$0.00	\$0					\$0	\$0	\$0
	022.00	Off Site Trucking	1,821	BWA	\$5.30	\$9,643					\$9,643	\$0	\$0
	023 Basement Walls	1 Poured 8" bitumedamp; sill plates	1,821	BWA	\$0.00	\$0					\$0	\$0	\$0
	023.00	Partial Height Basement Wall Framing	1	Not Used									
	023.10	Basement Wall Insulation	1	None									

Baseline Selections

FIGURE 6a

REPLACEMENT SHEET

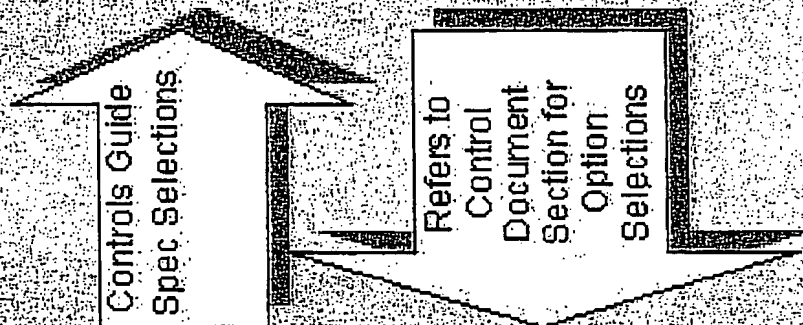
HOME SPECIFIC QUALITY / COST SELECTIONS									
237 System Selections									
© 2002 Project Planning & Management, Inc.									
Selection Switches									
TOTAL FINISHED AREA: 4,770 SF									
TOTAL CONSTRUCTED AREA: 0,333 SF									
MASTER BASELINE ITEM									
P21									
BENTON CITY, MO									
324 Eastonville Hallway									
SUBSYSTEM	DESCRIPTION	quan	unit	unit \$	total \$	BASELINE TOTAL	Savings		
011 Foundations									
011 Standard Foundations									
011.10	Spread footings (timber columns)	9	NOCLB	\$46.61	\$419	\$419	\$0		
011.10	Spread footings (ally columns)	5	EA	\$46.61	\$233	\$233	\$0		
011.20	Spread footings (foundation walls)	43	LF	\$13.53	\$582	\$582	\$0		
011.20	Spread footings (basement walls)	352	LF	\$18.47	\$6,506	\$6,506	\$0		
011.30	Foundation Wall (4' high)	80	LF	\$20.17	\$1,614	\$1,614	\$0		
011.40	Excavation: Foundation Wall Footing	195	SF	\$0.39	\$77	\$136	(\$59)		
012 Special Foundations									
021 Slab on Grade									
021.00	Ground Floor Slab on Grade	0	SF	\$0.00	\$0	\$0	\$0		
021.00	Garage Floor Slab on Grade	864	SF	\$2.69	\$2,328	\$2,328	\$0		
021.00	Basement Slab on Grade	3,198	SF	\$2.69	\$8,517	\$8,517	\$0		
021.10	Basement Slab Insulation	0	SF	\$0.00	\$0	\$0	\$0		
022 Excavation: Basement									
022.00	Off Site Trucking	1,068	CY	<RESELECT>	#VALUE!	\$6,725	\$6,725		
022.00	Off Site Trucking	0	CY	\$0.00	\$0	\$0	\$0		
023 Basement Walls									
023.00	Partial Height Basement Wall Framing	3,171	BWA	\$5.30	\$16,792	\$9,543	\$7,149		
023.10	Basement Wall Insulation	3,171	BWA	\$0.00	\$0	\$0	\$0		

Alternate Selections illustrating self documenting line item changes to component costs and Self-Correcting feature (Line 022 Basement Excavation) wherein "ERROR" was triggered when "Walkout Basement" was deselected in '40' Design Characteristics, requiring selection of Full Basement excavation options.

FIGURE 6b

**Residential Cost Estimation
Construction Summary
"Component Options"**

- **Control Document** that provides outline construction descriptions of the building systems as selected by the Owner
- **Serves a similar purpose as site and engineering drawings would provide** in that scope and construction requirements are called out for site, structural, mechanical, electrical and plumbing systems
- **Controls which material options are to be selected** in cases where options exist in the guide spec sections



**Guide Specifications
CSI MASTERFORMAT
Divisions 1-16**

- **Detailed Guide Specifications including all 16 CSI Divisions**
 - Division 1 - General Requirements
 - Division 2 - Site Construction
 - Division 3 - Concrete
 - Division 4 - Masonry
 - Division 5 - Metals
 - Division 6 - Wood And Plastics
 - Division 7 - Thermal And Moisture Protection
 - Division 8 - Doors And Windows
 - Division 9 - Finishes
 - Division 10 - Specialties
 - Division 11 - Equipment
 - Division 12 - Furnishings
 - Division 13 - Special Construction
 - Division 14 - Conveying Systems
 - Division 15 - Mechanical
 - Division 16 - Electrical

FIGURE 7